

WHAT IS CLAIMED IS:

1. An integrated system for processing a plurality of test samples and test sample devices for receiving said test samples, said test samples received in individual fluid receptacles, comprising:

5 a carrier for carrying a plurality of said individual fluid receptacles and a plurality of said test sample devices, each of said test sample devices placed in fluid communication with a test sample stored in one of said individual fluid receptacles;

a vacuum station adapted for manual insertion of said carrier into said vacuum station and manual removal of said carrier from said vacuum station, said vacuum station further comprising a source of vacuum, said vacuum source controlled so as to load said test samples
10 from said individual fluid receptacles into respective test sample devices; and

a carrier and test device processing subsystem remote from said vacuum station, comprising modules for processing said carrier and test sample devices, said modules including a module for conducting optical measurements of said test sample devices, wherein said carrier and test device processing subsystem and said vacuum station are integrated into a single
15 instrument and wherein said carrier is manually loaded into said carrier and test device processing subsystem after completion of vacuum loading of said test samples.

2. The system of claim 1, wherein said carrier and test device processing subsystem includes a transport system moving said carrier along a single longitudinal axis between a loading station in which said carrier is received and said modules.

3. The system of claim 2, wherein said modules further include a sealing station sealing said test sample devices.

4. The system of claim 3, wherein said modules further include an incubation station, and an autoloading station wherein said test sample devices are automatically removed from said carrier and inserted into said incubation station.

5. The system of claim 1, wherein said carrier and test device processing subsystem comprises:

- 1) a carrier loading and unloading station remote from said vacuum station;
- 2) a transport system for transporting said carrier from said loading and unloading

5 station through said carrier and test device processing subsystem;

- 3) a sealing system for sealing said test sample devices;
- 4) an incubation station for incubating said test sample devices;
- 5) an autoloading station for moving said test sample devices from said carrier into

said incubation station;

10 6) a reading station for reading said test sample devices; and

7) a disposal system receiving said test sample devices after the completion of reading of said test sample devices.

6. The system of claim 1, further comprising a carrier reading station having at least one reader for reading machine-readable indicia applied to a) said carrier and b) said test sample devices.

7. The system of claim 1, wherein said test sample devices comprise multi-well test sample cards.

8. The system of claim 5, wherein said transport system comprises a carrier-engaging member adapted to engage said carrier, and wherein said transport system is constructed and arranged so as to move said carrier back and forth along a single longitudinal axis between said carrier loading and unloading station, said sealing station, and said autoloading station.

9. The system of claim 1, further comprising:

a set of panels covering said instrument, said panels further forming a front portion of the instrument,

a user interface for said system;

5 a first door providing access for loading said carrier into said vacuum station;

a second door providing access for loading said carrier into said carrier and test device processing subsystem; and

a third door providing access to a disposal system receiving said test devices after completion of processing of said test devices by said modules.

10. An integrated system for processing a plurality of test samples and test sample devices for receiving said test samples, said test samples received in individual fluid receptacles, said system for use with a carrier holding a plurality of said fluid receptacles and a plurality of said test sample devices in a spaced relationship, each of said test sample devices having a transfer

5 tube providing fluid communication between said test sample device and one of said fluid receptacles received in said carrier, the system comprising:

a vacuum station adapted for manual insertion of said carrier into said vacuum station and removal of said carrier from said vacuum station, said vacuum station further comprising a source of vacuum, said vacuum source controlled so as to load said test samples from said individual fluid receptacles into respective test sample devices;

a first door providing access to said vacuum station;

a carrier and test device processing subsystem remote from said vacuum station, said carrier and test device processing system comprising apparatus for sealing said test devices, incubating said test devices, and reading said test devices; and

15 a second door providing access for said carrier to said carrier and test device processing subsystem.

11. The system of claim 10, wherein said carrier and test device processing subsystem comprises:

1) a carrier loading and unloading station remote from said vacuum station adapted for manual insertion of said carrier into said carrier and test device processing subsystem and for removal of said carrier from said carrier and test device processing subsystem;

2) a transport subassembly for transporting said carrier from said loading and unloading station through said carrier and test device processing subsystem;

3) a sealing system for cutting said transfer tubes and sealing said test sample devices;

10 4) an incubation station incubating said test sample devices;

5) an autoloading station moving test sample devices from said carrier into said incubation station;

6) a reading station reading said test sample devices; and

7) a disposal system receiving said test sample devices after the completion of

15 reading of said test sample devices.

12. The system of claim 11, wherein said transport subassembly comprises a carrier-engaging member adapted to engage said carrier, and wherein said transport subassembly is constructed and arranged so as to move said carrier back and forth along a single longitudinal axis between said carrier loading and unloading station, said sealing station, and said autoloading station.

13. The system of claim 10, further comprising a third door for providing access to said disposal system.

14. A method for processing a plurality of test samples contained in open receptacles with test sample devices, said receptacles and test sample devices carried by a carrier; each of said test sample devices having a transfer tube providing fluid communication between said test sample device and one of said fluid receptacles received in said carrier; comprising the steps of:

5 manually placing said carrier into a vacuum station having a chamber and applying vacuum to said vacuum station chamber to thereby transfer said test samples into said test sample devices as a batch;

manually removing said carrier from said vacuum station chamber after said transfer has been completed;

10 manually placing said carrier into an automated carrier and test device processing subsystem remote from said vacuum station,

automatically moving said carrier with a transport system in said carrier and test device processing subsystem to modules automatically a) sealing said test sample devices, b) incubating said test sample devices, and c) reading said test sample devices; and

15 wherein said vacuum station and said carrier and test device processing subsystem are integrated into a single test sample processing instrument.

15. The method of claim 14, wherein the carrier and test device processing subsystem further comprises:

1) a carrier loading and unloading station adapted for manual insertion of said carrier into said carrier and test device processing subsystem and for manual removal of said carrier
5 from said carrier and test device processing subsystem;

2) a transport subassembly for transporting said carrier from said loading and unloading station through said carrier and test device processing subsystem;

3) a sealing system for sealing said test sample devices;

4) an incubation station for incubating said test sample devices;

10 5) an autoloading loading station for moving test sample devices from said carrier into said incubation station;

6) a reading station for reading said test sample devices; and

7) a disposal system receiving said test sample devices after the completion of reading of said test sample devices;

15 8) a bar code reading station, and

9) a carrier and test sample device detection station.

16. The method of claim 15, wherein said transport subassembly comprises a carrier-engaging member adapted to engage said carrier, and wherein said transport subassembly is constructed and arranged so as to move said carrier back and forth along a single longitudinal direction between said carrier loading and unloading station, said sealing station, and said autoloading loading station.

17. The method of claim 14, wherein said test sample devices comprise multi-well test sample cards.

18. The system of claim 1, further comprising an incubation station having a cover panel, said cover panel providing access for a thermometer measuring the temperature of said incubation station, said thermometer providing visual indication of the instantaneous temperature inside said incubation station.

19. The system of claim 18, wherein said incubation station further comprises a carousel and an air distribution chamber through which air is supplied to said carousel, and wherein said thermometer monitors the temperature of said air distribution chamber.

20. The system of claim 10, further comprising an incubation station having a cover panel, said cover panel providing access for a thermometer measuring the temperature of said

incubation station, said thermometer providing visual indication of the instantaneous temperature inside said incubation station.

21. The system of claim 20, wherein said incubation station further comprises a carousel and an air distribution chamber through which air is supplied to said carousel, and wherein said thermometer monitors the temperature of said air distribution chamber.

22. The system of claim 1, further comprising a system of sensors and locks to control and monitor user access to the instrument enclosure.

23. The system of claim 10, further comprising a bar code reading station for reading bar codes on the carrier and the test sample devices.

24. The system of claim 10, further comprising a sensor station for determining the presence of the carrier and the presence and location of the test sample devices in the carrier.

25. The method of claim 14, further comprising the steps of moving the carrier to a bar code reading station and a station determining the presence of the carrier and the presence and location of the test sample devices in the carrier.